NAVY AND MARINE CORPS PUBLIC HEALTH CENTER
EPIDATA CENTER DEPARTMENT

Report: Methicillin-Resistant *Staphylococcus aureus* (MRSA) in the DOD, Quarter 3 2011

Clinical Epidemiology Division **CY 2011**

REPORT SUMMARY:

- MRSA incidence in the DOD has not increased in the past 6 years (Appendix B).
- In quarter 3 (Jul-Sep) 2011, the majority of MRSA infections were skin and soft tissue infections (67.6%) and community-associated infections (88.0%) (no change from previous quarter).
    - This trend was also observed for active duty service members (72.4% skin and soft tissue infections; 92.7% community associated infections) during quarter 3.
- MRSA remains highly susceptible to linezolid, trimethoprim/sulfamethoxazole and vancomycin (no change from previous quarter).
- Trimethoprim/sulfamethoxazole, vancomycin, and clindamycin were antibiotics most frequently prescribed for MRSA infection (no change from previous quarter).

Figure 1. MRSA infection incidence rates by month, per 100,000 DOD beneficiaries, 2011

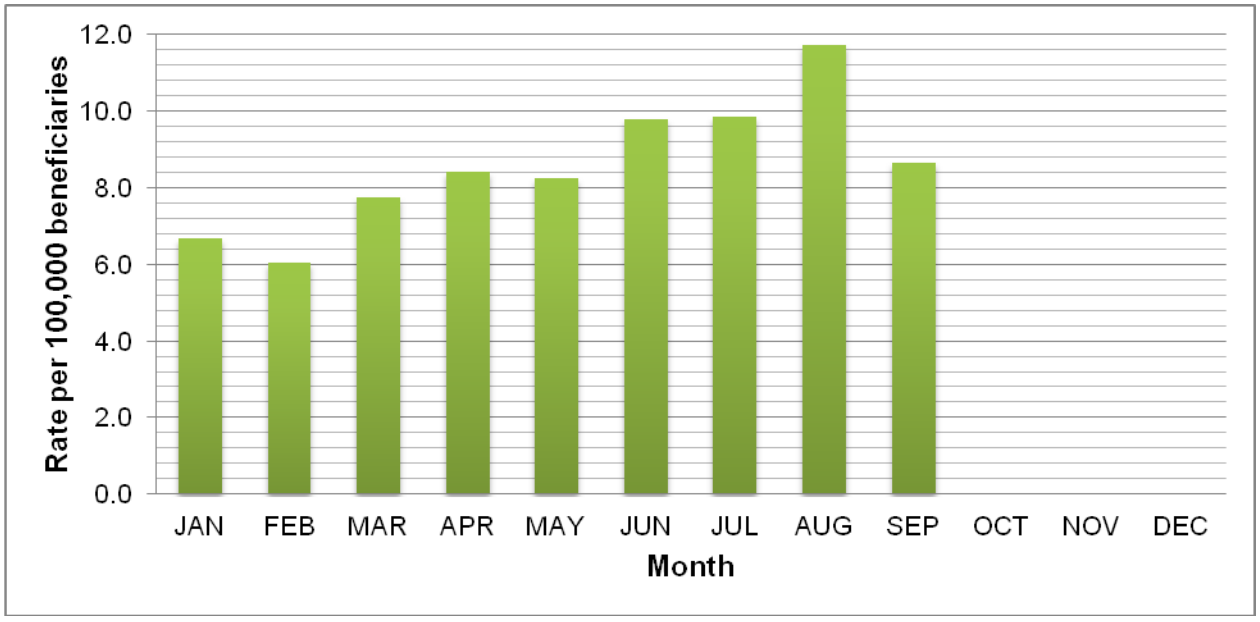


Table 1. Description of MRSA infections among DOD beneficiaries, N=2936, quarter 3 2011

	Count	Percent		Count	Percent
Gender			*TRICARE Region*		
Female	980	33.4%	Alaska	46	1.6%
Male	1956	66.6%	North	752	25.6%
Age Group			OCONUS	179	6.1%
0-4 years	282	9.6%	South	991	33.8%
5-17 years	269	9.2%	West	835	28.4%
18-24 years	1157	39.4%	Unknown	61	2.1%
25-64 years	1058	36.0%	*Encounter Type*		
65+ years	170	5.8%	Inpatient	212	7.2%
Sponsor Service			Outpatient	2636	89.8%
Air Force	421	14.3%	Other	88	3.0%
Army	1447	49.3%	*Healthcare/Community Associated*		
Marine Corps	466	15.9%	Hospital onset	6	0.2%
Navy	482	16.4%	Healthcare associated	348	11.9%
Other	120	16.4%	Community associated	2585	88.0%
Beneficiary Type			*Specimen Type*		
Active duty	1070	36.4%	Skin/soft tissue	1984	67.6%
Dependent	1006	34.3%	Invasive	44	1.5%
Retired	215	7.3%	Other non-invasive	835	28.4%
Other	309	10.5%	Unknown	73	2.5%

Table 2. Description of MRSA infections among active duty service members, N=1070, quarter 3 2011

	Count	Percent		Count	Percent
Gender			*Service*		
Female	185	17.3%	Air Force	140	13.1%
Male	885	82.7%	Army	510	47.7%
Encounter Type			Marine Corps	215	20.1%
Inpatient	42	3.9%	Navy	185	17.3%
Outpatient	967	90.4%	Other	20	17.3%
Other	61	5.7%	*Specimen Type*		
Healthcare/Community Associated			Skin/soft tissue	775	72.4%
Hospital onset	0	0.0%	Invasive	3	0.3%
Healthcare associated	78	7.3%	Other non-invasive	265	24.8%
Community associated	992	92.7%	Unknown	27	2.5%

Table 3. Antibiotic susceptibilities for MRSA infections among DOD beneficiaries, quarter 3 2011

		Susceptible	
	Number Tested	Count	Percent
Amoxicillin/clavulanate	428	3	0.7%
Cefazolin	372	3	0.8%
Cefoxitin	0	0	N/A
Cefotaxime	5	0	0.0%
Ceftriaxone	261	0	0.0%
Clindamycin	2471	2152	87.1%
Doxycycline	52	50	96.2%
Gentamicin	1627	1568	96.4%
Imipenem	2	0	0.0%
Linezolid	766	763	99.6%
Penicillin	2123	2	0.1%
Rifampin	1576	1570	99.6%
Tetracycline	2454	2374	96.7%
Trimethoprim/sulfamethoxazole	2606	2571	98.7%
Vancomycin	2505	2498	99.7%

Note: Susceptibility results only clinically significant when number tested is ≥30.

Table 4. Antibiotic prescriptions associated with MRSA infections, quarter 3 2011

	Oral - outpatient (N=1676)		Oral - inpatient (N=72)		Intravenous - all (N=208)	
	Count	Percent	Count	Percent	Count	Percent
Clindamycin	398	23.7%	29	40.3%	66	31.7%
Daptomycin	1	0.1%	0	0.0%	3	1.4%
Doxycycline	148	8.8%	6	8.3%	7	3.4%
Gentamicin	0	0.0%	0	0.0%	9	4.3%
Linezolid	3	0.2%	4	5.6%	4	1.9%
Minocycline	10	0.6%	1	1.4%	0	0.0%
Rifampin	39	2.3%	2	2.8%	0	0.0%
Tetracycline	1	0.1%	0	0.0%	0	0.0%
Trimeth/sulfa *	1255	74.9%	10	13.9%	0	0.0%
Vancomycin	9	0.5%	25	34.7%	149	71.6%

N=Number of people with at least one antibiotic of that type
***Trimeth/sulfa=trimethoprim/sulfamethoxazole**

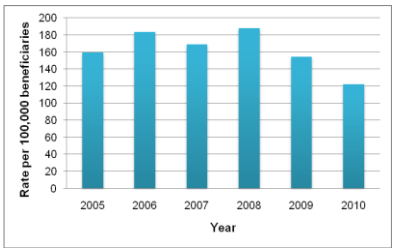
APPENDIX A: METHODS

MRSA isolates were identified using HL7 restructured microbiology data with specimen collection dates occurring within the quarter of interest. BacLink and WHONET software were used to identify MRSA isolates from these data. BacLink and WHONET are programs developed by the World Health organization to aid in the identification and analysis of multidrug-resistant organisms. MRSA was defined as an *S. aureus* isolate resistant to oxacillin. Isolates susceptible or intermediately susceptible to oxacillin were excluded, as were isolates without oxacillin susceptibility results. Additionally, isolates taken for surveillance purposes (nares or groin) were excluded, as these do not represent true infection. From the remaining isolates, the first MRSA isolate per person per 30 days was selected to represent unique infections. Demographics were described for each individual, while specimen types and antibiotic susceptibilities were described for each isolate (Definitions in Appendix B). Antibiotic prescriptions were evaluated using HL7 pharmacy data, consisting of Outpatient, Unit Dose, and Intravenous databases. Antibiotics selected for inclusion in the antibiogram and the analysis of antibiotic prescriptions were selected based on antibiotics recommended by the 2011 Clinical Practice Guidelines issued by the Infectious Diseases Society of America (IDSA)[1] as well as recommendations from clinical experts.

APPENDIX B: HISTORICAL TRENDS

A previous analysis conducted by NMCPHC concluded that there was no significant trend in MRSA incidence rates from 2005-2010 (Figure 2).

Figure 2. MRSA infection incidence rates, per 100,000 DOD beneficiaries, 2005-2010



APPENDIX C: DEFINITIONS

Demographics

Age group: Age at date of MRSA specimen collection
Sponsor service: Service indicated in Patient Category (PATCAT) code
Beneficiary type: Beneficiary status indicated in PATCAT code
TRICARE region: Requesting DMIS ID

Encounters

Encounter type: First letter of MEPRS code: A=Inpatient, B=outpatient, All other=Other
Hospital onset: Specimen collected ≥4 days after inpatient admission
Healthcare associated: Previous hospitalization within 12 months of specimen collection
Community associated: All others not meeting hospital onset or healthcare associated criteria

Infection type

Skin/soft tissue infection: Wound, abscess, skin, lesion, pustule, cellulitis, boil, pus, or carbuncle specimen sources
Invasive infection: Blood, cerebrospinal fluid, pleural fluid, pericardial fluid, peritoneal fluid, synovial fluid, bone specimen sources
Other non-invasive infection: All other specimen sources
Unknown: Specimen source not specified

Associated antibiotic prescriptions

Outpatient (oral – outpatient) database: Antibiotics prescribed 0-14 days following specimen collection
Unit Dose (oral – inpatient) database: Antibiotics prescribed 0-7 days following specimen collection
Intravenous database: Antibiotics prescribed 0-7 days following specimen collection

[1] Liu C, et al. Clinical practice guidelines by the Infectious Diseases Society of America for the treatment of methicillin-resistant *Staphylococcus aureus* infections in adults and children. *Clin Infect Dis* 2011; 52: 1-38.